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EFFECTIVENESS OF VISITOR INFORMATION ABOUT

APPROPRIATE BEHAVIOR IN OCCUPIED GRIZZLY

BEAR HABITAT

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EFFECTIVENESS OF VISITOR INFORMATION ABOUT
APPROPRIATE BEHAVIOR IN OCCUPIED GRIZZLY BEAR HABITAT

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Technical Completion Report

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PREFACE

The authors greatly appreciate the financial assistance provided by the Wilderness Management Research Unit of the USDA Forest Service, without which this study could not be conducted. The excellent cooperation of both Glacier National Park and Flathead National Forest made our sampling job much easier. Several of the questions concerning sources of information and perceptions of bears and safety of the backcountry were modeled after Trahan's (1987) study in Yellowstone National Park. External belief scales were modified from Kellert's (1978, 1985) work on attitudes towards animals. Finally, we wish to thank the hundreds of backcountry campers whose enthusiastic cooperation during the sampling and questionnaire phases provided the data necessary to test the hypotheses developed in the study.

THE PROBLEM

Wildland managers are increasingly concerned about encounters between grizzly bears and recreationists, particularly in backcountry or wilderness settings where the density of bears is the highest. While recreational use of these settings has stabilized or declined in the last few years (Lucas and McCool in press), the rate of bear-human encounters has apparently increased (Craighead 1982). Such incidents may lead to death or injury to humans and result in negative publicity and debate about the appropriateness of maintaining grizzly bear populations in national forests and parks. And frequently, the suspect bear is killed, reducing a population already threatened with extirpation.

Moreover, human-bear encounters may have other significant consequences. For the bears, these may include disturbance of normal movements or habitat, habituation to human activity, or increased dependency on humans for food with consequent nutritional problems. For humans, the consequences also may be negative, such as injury, or the extirpation of a species from an ecosystem. Or, such encounters may be positive, resulting in enhanced appreciation of the natural environment (Herrero 1974), higher levels of recreational satisfaction, or increased sensitivity to human impacts on forested ecosystems.

Managers of backcountry and wilderness areas have joint mandates to provide (implicitly safe) recreation opportunities to the public and to protect the wildlife, especially grizzly bears.

The grizzly bear, under provisions of the Endangered Species Act, is classified as threatened in the lower 48 states. However, bears which injure humans may be destroyed.

In response to these concerns, backcountry management agencies have developed bear management plans. A conceptual model of these plans is shown in Figure 1. While these plans are usually termed "bear management plans", much of the activity is actually directed at managing human use, particularly recreationists, of backcountry areas. Such management is either directed at temporarily closing areas or trails to recreationists or uses information to develop appropriate visitor behavior in the backcountry. These public information programs typically include warnings of bear danger; instructions on avoiding bears; directions concerning proper camping, food storage, and cooking techniques; suggestions dealing with appropriate human behavior during and immediately following an encounter with a bear; and other information about bear behavior, signs, movements and ecology.

Never-the-less, evidence suggests that human-bear encounters may be increasing (McArthur 1979). Martinka (1982) reported that for 30 years the relationship between the number of visitors to Glacier National Park and the number of confrontations with bears remained steady; in recent years, despite on-going, intensive public information programs, the ratio of confrontations to visitation has been increasing.

The increase in bear-human confrontations and the warnings

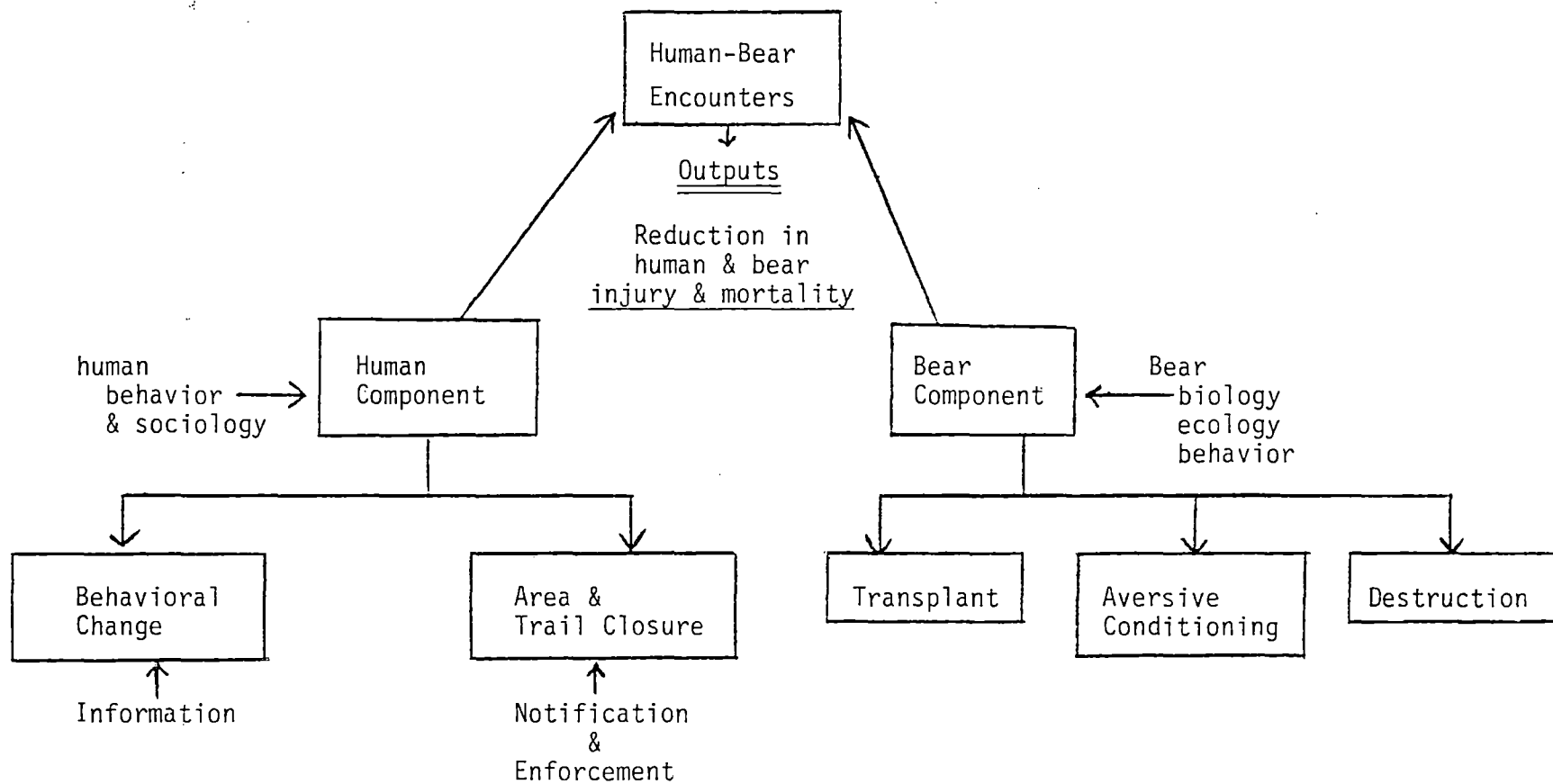


Figure 1. Conceptual model of bear management plan.

from bear researchers (for example, see Jonkel 1982) for increased public awareness points to gaps in our knowledge and resulting effectiveness of bear management programs: while much of the research on this issue focuses on bear biology and ecology, the bear management program relies heavily upon influencing human behavior, often with little understanding and application of sound persuasive communication and behavioral change principles.

STUDY OBJECTIVES

The overall purpose of the study is to enhance our understanding of the processes involved in effectively communicating to backcountry visitors appropriate behavior in grizzly bear habitat. Ultimately, such understanding should lead to a decrease in bear-human encounters. More specifically, the study has the following objectives:

1. Identify levels of knowledge visitors hold about appropriate behavior in grizzly bear habitat. This would include determining the level of awareness of appropriate behaviors, what to do if a bear is encountered, and knowledge about bear identification, behavior, biology and ecology.
2. Determine beliefs and attitudes about grizzly bears. Beliefs and attitudes are important influences on behavior (Fishbein and Ajzen 1975), and linking behavior to knowledge levels would be incomplete

without an understanding of beliefs and attitudes.

3. Identify past behavior or behavioral intentions of backcountry visitors. Backcountry visitors will be queried about their camping and hiking behavior or intended behavior. The results from this component will determine if the message is received and accepted.

4. Determine sources of information about appropriate behavior in grizzly bear habitat. This component will help identify the relative importance of backcountry agencies in communicating information about appropriate behavior.

LITERATURE REVIEW

It is well known in social-psychological research, as well as from more specific applications to forest recreational settings, that human responses to public information campaigns, use restrictions, brochures and other measures are related to visitor attitudes, perceptions, value systems, and knowledge. Understanding human behavior requires linking beliefs and attitudes with behavioral intentions (Fishbein and Ajzen 1975). A favorable attitude toward a given behavioral alternative, however, does not inevitably result in the selection of that alternative, thus attitudes by themselves are not necessarily predictive of human behavior.

Joep and Shelby (1984) stated attitudes are difficult to change and may not be directly related to the behaviors, which

actually cause or avert problems. They found in their survey of visitors in Glacier National Park, that 65% had positive attitudes toward bears. It was determined that reading outdoor literature or past knowledge had little effect on these attitudes. When given a hypothetical bear encounter most respondents chose the "correct" course of action. However, the behavioral intentions of the respondents were unrelated to attitude intensity. Also, attitudes are affected by how a person perceives a risk, deals with danger or uncertainty and potential behavioral responses when a hazard is present. However, people often react to bear warnings with an "it can't happen to me" attitude. More research will aid in the understanding of how backcountry users perceive bears.

For example, Chester's (1980) study of human-bear interactions in the forests of Yellowstone reported that a considerable number of backcountry users reported engaging in activities that could increase detrimental encounters with grizzly bears. The current informational program apparently was not effective in changing visitors' behavior.

However, the use of information has been an appealing non-regulatory approach to wilderness management that has permitted the manager to adopt less intrusive actions (Lucas 1981). And, many agree that the public reacts more favorably to control by information dispersion than regulatory controls (Bury and Fish 1980).

The use of information as a management tool has been

effective in modifying some types of visitor behavior. Krumpke and Brown (1982) determined that 30% of backcountry visitors selected alternate routes when given a "trail selector" guide at ranger stations. Information regarding potential visitor impacts may lead to appropriate behaviors to reduce such impacts. Oliver et al. (1985) tested the effectiveness of information given to recreationists in a developed campground. Observed behavior indicated a 50 to 80 percent reduction in depreciative behavior depending on the method of information dispersal. Although the Oliver study used on-site observation to determine the actual behavior of recreationists in relation to given information, most studies have relied on off-site program evaluations.

The off-site evaluation method makes it very difficult to determine actual behavior and information retention. Information retention has been tested in on-site evaluations; however, this usually occurs within 24 to 48 hours of receiving the information. Long term information retention (greater than 1 month) needs to be tested to determine how long newly acquired knowledge is retained (Dowell and McCool 1986). This use of off-site measures indicates the need to identify visitors' behavioral intentions.

Research relating actual levels of knowledge about appropriate behavior and actual behavior suggests mixed results. Robertson (1982) investigated the relationship between knowledge levels and appropriate behavior in wilderness areas and determined that knowledge levels explained 35% of the variance in

visitor behavior. However, she did not measure actual changes in knowledge levels or behavior resulting from additional information. MacAvoy and Harborg (1984) determined in their study of wilderness users in the Boundary Waters Canoe Area that knowledge of use rules was high, but that inappropriate behavior was widespread and increasing.

Information must be delivered at the appropriate stage in trip planning and execution to insure that the recreationists will be effectively influenced (Brown and others 1988, Anderson and Manfredo 1986). Lime and Lucas (1977) sent information brochures to aid potential visitors to the Boundary Waters Canoe Area in their trip planning. The brochure was found to be effective in dispersing use and transferring general information to visitors. Other studies have shown information distributed on-site often fails to influence the visitors' travel or destination plans (Lucas 1981).

Information dispersal should not rely on written material alone. Much of the research on the effectiveness of particular dispersion methods of information supports the use of personal contact versus the impersonal methods of brochures and media (Washburne and Cole 1983, MacAvoy and Harborg 1984). Other studies have shown that information should be distributed in a variety of methods to reach a majority of the target audience (Schwabb 1982, Fazio and Gilbert 1981). As recreation user groups differ, the medium for information transfer should differ. For example, Fazio and Gilbert determined that backcountry users

in Rocky Mountain National Park showed that their knowledge and acceptance of low impact camping had increased significantly after a viewing a sound-slide show. Previously, there had been little or no change in knowledge levels when brochures had been distributed. Thus, the appropriate method of persuasive communication needs to be matched with the target audience.

Other factors must be considered in the communication process. These include source credibility (Cockrell and others 1984), previous experience (Huffman and Williams 1986), degree of specialization (Williams and Huffman 1986) and previous existing beliefs (Fishbein and Ajzen 1975). Cockrell and others studied the amount of influence that persons who verbally expressed expectations of persons (definers) and those who served as examples (models). They found that models (guides, family members and others present on the trip) were significantly more influential than definers (managers, family, friends, and other recreationists not present on the trip). This suggests that recreation participants are more effective in forming and influencing other participants than non-participants. The study suggests that communication may be more effective if channeled through group leaders, outfitters, or family and friends.

However, Dorman and Fridgen (1982) found outdoor recreation vehicle regulation information that was transmitted through informal channels (family and friends) was often less accurate than information transferred through formal channels (brochures, managers). The more credible the receiver (recreationist) of

information views the sender (manager), the greater the chances of effectively influencing the receiver (Fazio and Gilbert 1981). Recreation managers must be acknowledged by the visitor as a credible source of information both in person and on paper.

Williams and Huffman (1986) surveyed visitors at Rocky Mountain National Park to determine if the level of specialization and previous experience of visitors influenced the effectiveness of information programs. It was determined that experienced visitors were less likely to use trail information and highly specialized recreationists tended to seek out additional information.

There has been much research done on the effectiveness of particular methods of information dispersal in relation to an increase in knowledge levels, but little work has looked at the relationship between information transfer and actual behavioral changes. Knowledge, attitudes, and behavioral intentions may change but actual behavior may not be altered (Dowell and McCool 1986). Much of the research appears to deal with one or several components (effectiveness of programs, behavioral intentions) of information transfer, but very few studies have actually investigated the entire process.

Very little of the research has investigated levels of knowledge, attitudes, beliefs and behaviors in grizzly bear backcountry areas. Since managers rely heavily on the use of information programs to convey appropriate behaviors in backcountry areas, a better understanding of the current

programs, visitor knowledge, attitudes, and beliefs is important. With a better understanding of the visitors to their wildland areas, managers can improve public information programs and other actions to reduce human-bear conflicts which pose a continual danger to the safety of recreationists and a threat to the survival of bear populations.

In summary, (1) bear management is, in large part, the management of human visitors to bear country, (2) noted bear researchers and data from recent studies suggest that current people management efforts are not as effective in altering human behavior as they might be, and (3) more information is needed concerning the linkages between human attitudes, knowledge, and behavior in bear country in the backcountry of the West.

CONCEPTUAL FRAMEWORK

Figure 2 is a simplified model of persuasive communications built primarily upon the work of Fishbein and Ajzen (1975) that serves as the overall, generalized, approach to the research reported here. Briefly, the model demonstrates that information affects behavior only indirectly, that is, information, once received and accepted, results in certain changes in beliefs and attitudes, which in turn affect the recipient's intentions to perform the suggested behavior, which then is related to actual behavior in any given situation. The large number of variables intervening between reception of information and actual behavior suggests that wildland managers need to better understand

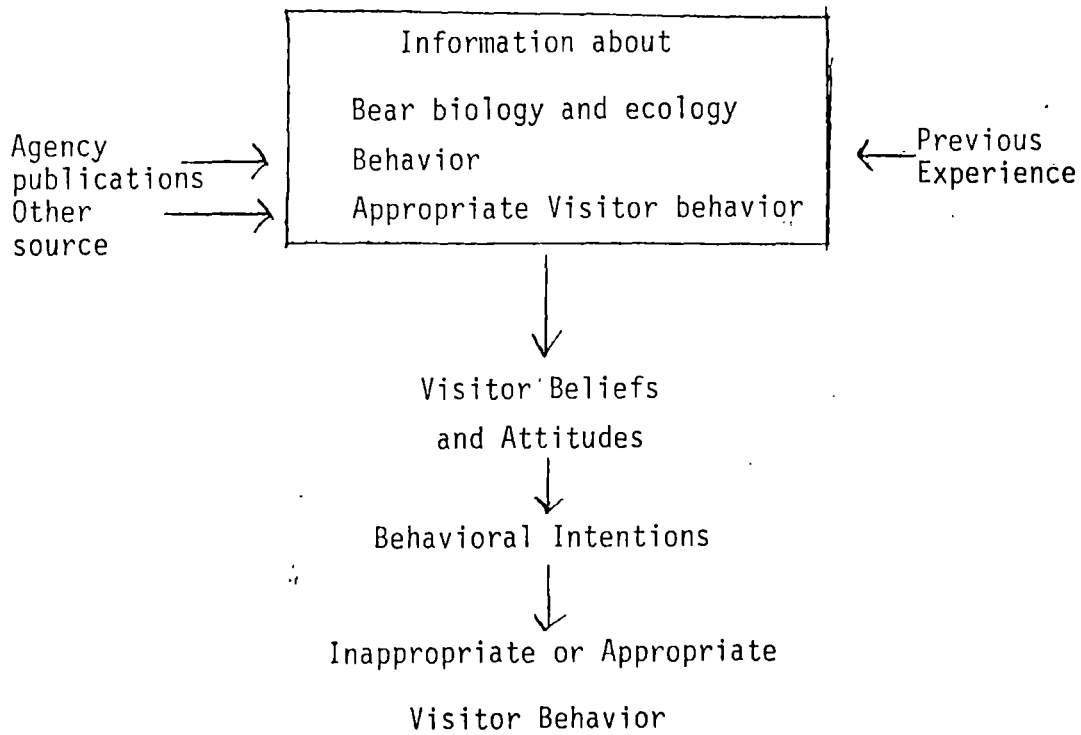


Figure 2. Generalized conceptual model depicting influence of information on behavior.

processes of belief and attitude formation and how these influence actual behavior. Without such understanding, managers will likely continue to base persuasive communication efforts on implicitly invalid models of behavioral change.

The model shows that in the first phases of the persuasive process, information about appropriate behavior is received from several sources, including friends and referents, agency brochures and literature, books, magazine articles and even films. Previous camping experience may also play an important role at this stage in determining appropriate behavior (AB). Such sources help establish and influence broader (termed "external" by Fishbein) beliefs about grizzly bears which in turn may affect more direct beliefs about AB in occupied habitat. Beliefs about the grizzly bear's role as an essential component of the ecosystem, for example, may in turn influence a visitors' belief that food should be stored in such a way as to deter a dependency on unnatural food sources. Such prior existing broader (external) beliefs, or more direct (primary) ones may be supportive or contradictory to agency AB communications.

Reference group norms can be powerful influences on the reception and acceptance of agency persuasive communications. Fishbein and Ajzen (1975) argue that, ultimately, perceptions of significant others' (say, camping companions or park rangers) expectations of AB and individual motivation to comply with those expectations may influence behavior as much as changes in beliefs brought about by a persuasive communications program, an

hypothesis which has not been addressed in the literature concerning effectiveness of agency communications. They state:

For some behaviors, normative considerations (expectations of friends, family, etc.) may be more important in determining behavioral intentions than are attitudinal consideration (the expected outcomes of the act). For other behaviors, the reverse may be true. In a similar fashion we may expect that the relative importance of the two components will be influenced by situational variables, such as the behavior's observability, and by personal characteristics and preferences.

One can easily visualize how the normative expectations of camping companions could outweigh the anonymous advice about AB contained in an agency brochure.

Several other questions are also of immediate interest. In order for beliefs about AB to be changed, the message must not only be received but accepted as well. Therefore, to what extent do visitors acknowledge reception of the message sent? Do visitors hold beliefs similar to those stated in agency communications? For how long are messages about AB retained? There are, of course, still other questions that deserve examination, but which should await field examination of the above questions: How effective are different facilitative efforts in communicating beliefs? What is the impact of a high fear arousal message versus a low fear arousal message? How do

visitors view agencies in terms of credibility?

HYPOTHESES

Objective One. Identify levels of knowledge visitors hold about appropriate behavior in grizzly bear habitat

Fishbein and Azjen (1975) have detailed how knowledge (primary beliefs) are associated with behavioral intentions (which are the immediate precursors of behavior). Knowledge levels will be assessed two different ways:

1. the visitor's level of knowledge about appropriate behavior assessed through a true-false test;
2. the visitor's beliefs about the consequences of engaging in certain appropriate and inappropriate behaviors.

In the terminology of this conceptual approach, such knowledge or beliefs are termed "primary beliefs" because they should directly affect behavioral intentions. Beliefs which affect primary beliefs but not behavioral intentions are termed external beliefs. Cognitive beliefs (knowledge levels) about grizzly bear behavior, identification, and ecology are important components of most agency communications with respect to AB, apparently based on the assumption that greater understanding of the context of AB will lead to more frequent performance of it.

Thus,

H1: Beliefs about appropriate behavior, the consequences of appropriate behavior, and grizzly bear biology, identification, and ecology are correlated positively.

Objective Two. Determine beliefs and attitudes about grizzly bears

Data on beliefs collected under Objective One will be statistically tested for linkages with external beliefs. External beliefs are those beliefs which do not directly correspond with agency information items but which affect primary beliefs, and thus have an indirect affect on AB. Four external beliefs will be examined in this study, and are based on Kellert's (1978, 1985) study of attitudes towards animals:

1. Ecologistic beliefs -- these are beliefs about the interrelationships characteristic of natural systems and the place of the grizzly bear within that system. Individuals holding ecologistic beliefs would be expected to have a greater appreciation of the role of the grizzly bear in backcountry areas and a greater sensitivity to human influence on it. Thus, H2: Ecologistic beliefs are correlated positively with knowledge of AB, the consequences of AB, and grizzly bear identification, biology, and ecology.

2. Naturalistic beliefs -- these are beliefs which are based on an interest in and affection for wildlife and the outdoors. These differ from ecologistic beliefs in that appreciation of wildlife as an object rather than as its place in the system of things is the primary orientation. Never-the-less, those holding highly naturalistic beliefs would be expected to be sensitive to human influence on grizzly bears and thus,

H3: Naturalistic beliefs are positively correlated with knowledge of AB, the consequences of AB, and grizzly bear identification, biology, and ecology.

3. Moralistic beliefs -- these are beliefs which concern the right and wrong treatment of animals, with strong opposition to exploitation of and cruelty toward animals. These beliefs would be expected to be independent of knowledge of AB and its consequences, but associated with grizzly bear identification, biology, and ecology. Thus,

H4: Moralistic beliefs are not correlated with knowledge of AB and its consequences; and,

H5: Moralistic beliefs are positively associated with grizzly bear identification, biology, and ecology.

4. Negativistic beliefs -- these beliefs indicate a primary orientation toward an active avoidance of animals due either to fear or dislike. Individuals holding highly negativistic beliefs toward grizzly bears would be expected to seek situations where grizzly bears were unlikely to be encountered. Individuals with negativistic beliefs are probably those with little experience in the backcountry and those who have received information primarily from non-agency sources. Thus,

H6: Negativistic beliefs are positively associated with settings which have both low objective and subjective probabilities of encountering grizzly bears; and,

H7: Negativistic beliefs are positively associated with perceptions that grizzly bears represent a danger to backcountry

users and negatively associated with feelings of safety while in the backcountry.

Objective Three. Identify past behavior or behavioral intentions of backcountry users

Ultimately, the test of communications effectiveness is use of AB. A review of the literature given to backcountry visitors suggests the use of 13 behaviors, listed in Table 1, to reduce confrontations with grizzly bears. Respondents will be asked to indicate if they used each of 13 identified AB during their backcountry visit. Fishbein and Ajzen note, however, that the correlation between behavioral intentions and behavior depends on that part of behavior which is under volitional control of the subject: "the intention-behavior relation will break down if performance of the behavior depends on certain abilities or resources that the actor does not possess" If visitors have not equipped themselves to, say, hang food from a tree (using rope), they will not be able to do so even if they have the intention. Thus, it is important to determine what equipment visitors carry with them. Thus,

H8: Use of AB is greatest for those visitors more appropriately equipped than those who are not.

According to the framework in this study, behavior is a function of attitudes toward behavior as well as the subjective norm. Fishbein and Ajzen posit that this relationship can be

expressed in the form of a multiple regression equation of the form

$$B \sim BI = w1(AB) + w2(SN)$$

The weights (or standardized beta coefficients) indicate how important each independent variable is in the equation. The importance apparently varies from behavior to behavior. Thus, H9: The multiple regression equation will explain a significant amount of variance in B; and,

H10: Both standardized beta coefficients are statistically significant.

Respondents in the study will be asked to report actual behavior rather than behavioral intentions. In order to determine if actual behavior reflects behavioral intentions, a sample of selected respondents will be asked to indicate intentions prior to leaving for the trip. These BI will be compared to reported B.

Thus,

H11: BI is positively correlated with B.

Objective 4. Determine sources of information about AB in grizzly bear habitat

Visitors may receive information and thus form beliefs from a variety of sources, including that of the agency. Ten potential sources of information about AB have been identified. Source credibility is an important variable in influencing formation of beliefs and implementation of resulting AB.

Visitors will be asked to indicate what sources were used to get

information about AB. They will also be asked to indicate which source has the greatest reliability for information about AB.

Thus,

H12: Adoption of AB will be greater for those indicating use of agency sources than those that indicate other sources; and,

H13: Adoption of AB will be greater for those indicating agency is a reliable source of information.

METHODOLOGY

The Population

The population to be studied includes all those visitors staying overnight in the backcountry aged 16 years and older. It is further defined to include only those backcountry campers using Jewel Basin Hiking Area (JBHA) during the period July 18 - August 30, 1987, and all those backcountry campers visiting the Sperry Chalet - Gunsight Lake (SC) and Many Glacier - Granite Park Chalet (MG) areas in Glacier National Park during the period July 25 - August 30, 1987. The Sperry Chalet - Gunsight Lake area is defined as having a low objective probability of encountering grizzly bears while the Many Glacier - Granite Park Chalet is defined as having a high objective probability of encountering grizzly bears.

Sampling Plan

Visitors to Jewel Basin were contacted on weekend days as they entered or left the area at the principal trailhead, Camp Misery.

Visitors to the Glacier National Park backcountry were sampled at three of the offices issuing backcountry camping permits. The sampling plan was based upon estimates of where permits for the two backcountry areas included in the study are issued.

Observation Instrument

The observation instrument used to gather data necessary to test the above hypotheses is shown in Appendix A. The observation instrument was administered as a mail return questionnaire and sent to respondents to complete after the initial field contact.

The observation instrument was administered as follows:

At the initial contact, the name and address of cooperating visitors was recorded. At the end of the summer season, mid-September, the mail return questionnaire was sent to all those cooperating in the study. One week following the initial mailing, a post card reminder was sent. Two weeks after this, a second questionnaire was mailed. A 90% response rate resulted in a sample of 186 for Jewel Basin, 220 for Sperry Chalet-Gunsight Lake, and 240 for the Many Glacier-Granite Park Chalet areas.

Table 1. Appropriate backcountry camping behaviors recommended to reduce confrontations with grizzly bears.

1. Store food in trees or poles
2. Make noise on trail
3. Camp or hike in large group (over 5 people)
4. Cook 300 feet away from campsite
5. Wear or use bear bells
6. Wash dishes after every meal
7. Do not cook greasy foods
8. Use odor restrictive food containers
9. Wear clean clothes while sleeping
10. Cook downhill from sleeping area
11. Camp away from animal or hiking trails
12. Carry garbage out
13. Do not hike after dark

RESULTS

Visitor Characteristics

Visitors to the three areas differed dramatically in a variety of social-demographic characteristics. Nearly 80% of the visitors to the two GNP areas are non-residents of Montana, contrasted to JBHA where about 80% were residents. About 67% of the visitors responding to the survey were male, with little difference among the three areas studied. Median ages varied somewhat with area. Occupations of visitors differed significantly as shown in Table 2. The greatest differences in occupations appears to be in the professional/technical, craftsmen, and student categories. Visitors to JBHA report are more likely to be craftsmen than visitors to the other areas and

Table 2. Occupation by area, in percent*

<u>Occupation</u>	Area		
	<u>JBHA</u> (N=162)	<u>MG</u> (N=201)	<u>SC</u> (N=196)
Professional, Technical	38.3	46.13	44.3
Managers/Administrators	8.0	9.5	7.7
Sales	3.7	3.5	5.6
Clerical	2.5	2.0	1.5
Craftsmen	13.6	1.0	5.6
Transport	2.5	0.5	1.5
Laborers	4.3	0.5	0.5
Farm Managers	0.0	0.0	0.5
Service Workers	4.9	6.5	7.1
Student	15.4	27.4	23.0
Housewife	4.3	0.5	2.0
Retired	1.2	1.0	0.0
Military	0.6	0.0	0.5
Unemployed	0.6	1.5	0.0

*Chi-square = 60.2, alpha = .001

less likely to be professional/technical workers and students. This probably reflects the workforce composition of Flathead Valley where the majority of JBHA visitors reside. These differences are also reflected in the data concerning type of community in which respondents live (Table 3). While nearly 75%

Table 3. Size of community in which visitors reside by area; in percent*

Community Size	JBHA (N=163)	Area MG (N=202)	SC (N=198)
Large City	4.9	28.2	28.8
Medium City	5.5	22.8	29.3
Small City	49.1	28.2	23.2
Town	15.3	10.9	5.6
Rural	23.9	8.9	10.6
Farm	1.2	1.0	2.5

*Chi-square = 103.3, alpha = .001

of the JBHA visitors resided in a small city or rural environment, half of the visitors to the two GNP areas resided in medium to large cities.

Table 4 shows that visitors to JBHA are generally much more experienced in camping in northern Rockies situations than visitors to the two GNP areas, suggesting the importance of communicating well to visitors in the GNP areas. Tables 5 and 6 also show significant differences in the social context of the visit among the areas, with visitors to JBHA more likely to camp in larger groups and in family contexts. The larger percentage of individuals camping alone in MG and SC areas is especially significant given the recommendation to camp in larger groups.

Table 4. Experience of respondents by area, in percent

<u>Variable</u>	<u>Area</u>		
	<u>JBHA</u>	<u>MG</u>	<u>SC</u>
First Visit to Area*	39.4	69.2	65.8
Four or more visits*	28.1	17.3	19.2
No visits in Northern Rockies*	14.7	66.3	60.3

*Differences among areas statistically significant at alpha = .01

Table 6. Group size by area, in percent*

<u>Group Size</u>	<u>Area</u>		
	<u>JBHA</u> (N=164)	<u>MG</u> (N=197)	<u>SC</u> (N=195)
1-2	43.9	58.9	67.2
3-4	32.3	28.9	24.1
5-6	15.9	3.0	8.2
7-10	5.5	6.1	0.5
11 or more	2.4	3.0	0.0

*Chi-square = 42.5, alpha = .001

Table 6. Type of group by area, in percent*

<u>Group Type</u>	Area		
	<u>JBHA</u> (N=165)	<u>MG</u> (N=198)	<u>SC</u> (N=199)
Alone	5.5	10.1	14.1
Family	45.5	20.2	34.7
Friends	27.3	52.0	40.7
Family & Friends	12.7	10.6	6.0
Guide/Outfitter	0.0	2.0	4.0
Club	9.1	5.1	0.5

*Chi-Square = 63.89, alpha = .001

The very low average group size reported by visitors to all three areas also contrasts with the recommendation to camp and backpack in groups of five or more. Group sizes are slightly larger in JBHA, reflecting the greater tendency there for family camping.

Visitor Knowledge and Beliefs about Appropriate Behavior

Visitors were asked to respond to several questions dealing with knowledge of appropriate behavior (AB): (1) their assessment of their knowledge of what actions to take if they do encounter a bear; (2) a set of true-false items dealing with behavior and knowledge about grizzly bear biology, ecology, and identification; and (3) a set of items assessing their beliefs

about the likelihood of AB in reducing confrontations with grizzly bears.

Most visitors were confident of knowing what to do during an encounter, but there were significant differences in confidence levels between JBHA visitors and visitors in the two GNP areas. While 71% of the JBHA visitors thought they would know what to do over 80% of the GNP visitors felt that way (differences among the three areas statistically significant at $\alpha = .039$).

Visitors were presented with a 25 item true-false quiz covering two domains: (1) level of knowledge about AB, and (2) grizzly bear identification, biology, ecology and behavior. Scores on these two domains, as well as the total scale score, differed significantly among the three areas (Table 7). Visitors to JBHA tended to be the most knowledgeable overall while visitors to the SC area tended to be least knowledgeable. The greatest difference in knowledge levels is in the area of identification, biology, and ecology. JBHA visitors tend to be more knowledgeable in this subject, partly because many JBHA visitors are local residents and are confronted with a continuous flood of information about grizzly bears.

Visitor beliefs about the likelihood of AB reducing confrontations with grizzly bears were assessed through a question concerning 13 recommended appropriate behaviors. Table 8 shows some differences among visitors to the three areas in their beliefs. The extent to which beliefs about the consequences of the behaviors are held is also shown in this

Table 7. Grizzly bear knowledge by area.

<u>Knowledge Scale</u>	<u>JBHA</u>	<u>Area</u> <u>MG</u>	<u>SC</u>
Appropriate Behavior . (SCORE)	9.1	9.5	9.2
Identification, biology, and ecology . (GBIBE)	10.2	9.5	9.2
Total knowledge score . (KNOW)	19.4	18.9	18.6

Maximum score = 11

Maximum score = 14, differences between JBHA and GNP visitors statistically significant at alpha = .001.

Maximum score = 25, differences between SC and JBHA visitors statistically significant at alpha = .06.

table. Generally, MG visitors hold these beliefs to a greater extent than visitors to the other areas. Two of the behaviors, hiking after dark and cooking fish/bacon for meals were stated opposite the desired AB direction to correct for response set. Unfortunately, as they were stated appeared to confuse respondents, and thus were dropped from remaining analyses.

Hypothesis One states that "Beliefs about appropriate behavior, the consequences of appropriate behavior and grizzly bear biology, identification and ecology are correlated positively." To test this hypothesis, a summated scale was developed from responses to the eleven remaining appropriate behaviors. This scale, known as the "Consequences of Appropriate

Table 8. Beliefs about the likelihood of an AB reducing confrontations with grizzly bears by area, in percent stating AB is "very likely."

<u>Behavior</u>	<u>Area</u>		
	<u>JBHA</u>	<u>MG</u>	<u>SC</u>
Hang food in tree or pole*	56.4	70.3	69.7
Make noise on trail	54.9	54.5	50.8
Travel in large group	40.7	30.8	25.9
Cook away from camping area*	37.4	47.3	43.7
Wear bear bells	26.1	30.7	27.6
Wash dishes after each meal	45.4	51.0	48.0
Cook fish/bacon	6.9	5.0	7.7
Use odor proof containers	41.4	41.8	44.9
Sleep in clean clothes	29.0	25.7	32.7
Cook downhill from camp area*	20.8	26.5	32.5
Camp away from trails	27.0	34.3	35.0
Carry garbage out	59.9	65.7	64.8
Hike after dark	6.3	7.5	10.6

*Chi-square analysis indicates that differences among areas statistically significant at alpha = .05.

Behavior" or CAB scale was then correlated with the three beliefs scales from the 25 item true-false quiz. Results are shown in Table 9. None of the Spearman's rho correlation coefficients between CAB and measures of beliefs were statistically

significant, although positive.

Table 9. Spearman's Rho correlations among primary belief scales

CAB	.04	.03	.08
KNOW	.61	.29	
GB1BE	.91		
	SCORE	GB1BE	KNOW

Visitor Beliefs about Bears

Four external beliefs about bears were measured in this study. (External beliefs are those that do not directly correspond to informational items but which affect primary beliefs, and thus may have an indirect affect on performance of AB.) The four external beliefs were developed from Kellert's 1978 study of attitudes toward animals and included Ecologicistic Beliefs, Naturalistic Beliefs, Moralistic Beliefs, and Negativistic Beliefs. Each external belief was measured through a standard Likert type scale using several items. A cluster analysis was then used to identify which item clustered on which belief scale. Cronbach's alpha reliability coefficients were established, and items evaluated for their contribution to the reliability of the scale. The resulting external belief scales, items on each scale and final Cronbach's alpha are shown in Table

items on each scale and final Cronbach's alpha are shown in Table 10.

Table 11 shows the differences in strengths to which the three samples hold each of the beliefs. Ecologistic beliefs were held the most strongly, while negativistic beliefs were the weakest. On all four belief scales, there are significant differences in belief strength, with most differences being between JBHA and GNP visitors. Negativistic beliefs were most strongly held by JBHA visitors while the other three beliefs were most strongly held by MG visitors. Visitors to the SC area are in between in belief strength.

Hypothesis Two states that "Ecologistic beliefs are correlated positively with knowledge of AB, the consequences of AB, and grizzly bear identification, biology and ecology." To test this hypothesis, a Spearman's Rho correlation coefficients were used, and results are shown in Table 12. The data show positive, statistically significant correlations in the direction hypothesized, thus supporting the hypothesis. The correlations are not extremely high, but one must remember that external beliefs exert indirect effects on behavior and knowledge levels.

Hypothesis Three is similar to Hypothesis Two except that it concerns Naturalistic beliefs. The data in Table 12 partially support this Hypothesis. Knowledge scores are in the direction hypothesized and statistically significant, but the correlation between Naturalistic beliefs and beliefs about the consequences of AB is not statistically significant from zero. This suggests

Table 10. Items comprising external belief scales.

	<u>Cronbach's alpha</u>
<u>Negativistic Belief</u>	.59

Grizzly bears should be eliminated in areas outside of national parks.

Montana would be a nicer place to live if fewer dangerous animals, like grizzly bears, were found here.

Some animals, like grizzly bears, wolves, and rattlesnakes are naturally cruel.

<u>Ecologistic Belief</u>	.78
---------------------------	-----

I think grizzly bears are essential to the balance of nature.

To me, the grizzly bear symbolizes the beauty and wonder of nature.

I think grizzly bears are among the few animals who will kill for the pleasure of killing.

If oil or natural gas were discovered in grizzly habitat, the resource should be extracted even if it harmed bears.

I think when grizzly bears kill cattle and sheep they must be eliminated.

Because people and cattle live practically everywhere in the United States, and grizzly bears only in Montana and Alaska, I think Montana should make sacrifices when there is a conflict with the bear.

Agencies should provide more natural conditions for grizzly bears, even if this means more visitor restrictions.

In my opinion, the grizzly bear is essential for keeping other plant and animal species in proper balance with nature.

Table 10. Items comprising external belief scales (continued).

Cronbach's alpha

Naturalistic Belief

.82

Seeing a grizzly bear in the wild would be one of the greatest outdoor experiences of my life.

It is the presence of grizzly bears that makes a wilderness experience so wonderful.

I would very much like to see a grizzly bear in the wild.

I think it would be wonderful to see grizzly bear sign in the wild.

Moralistic Belief

.75

I think the hunting season on grizzly bears encourages more illegal killing of them.

I believe so many grizzly bears are being illegally killed in Montana that if something is not done to stop it, the bear will soon disappear from the state.

The current hunting season on grizzly bears confuses the public about the need to protect them.

If farmers were more careful about how they take care of their cattle, there would be fewer livestock killed by grizzlies.

Table 11. Mean external belief scores by area.

<u>Belief</u>	<u>Area</u>		
	<u>JBHA</u>	<u>MG</u>	<u>SC</u>
Negativistic*	1.6	1.4	1.5
Naturalistic*	3.4	3.8	3.7
Moralistic*	2.8	3.3	3.2
Ecologistic*	3.8	4.2	4.0

*ANOVA indicates differences among mean scores statistically significant at alpha = .01.

that while visitors may hold beliefs about grizzly bears as objects of appreciation, and thus have knowledge of their ecology, biology, and physical characteristics, they may not know about the consequences of appropriate behaviors in terms of reduction of confrontations.

Hypothesis Four states that Moralistic beliefs are not correlated with knowledge of AB and its consequences. The Spearman's rho correlation between Moralistic beliefs and knowledge of AB was statistically significant, but so low as to have little practical meaning. Moralistic beliefs were not correlated with beliefs about consequences. Hypothesis Five stated that Moralistic beliefs are associated with grizzly bear identification, biology and ecology; however, the data did not support this hypothesis.

Table 12. Correlations between external beliefs, knowledge levels, and beliefs about consequences of appropriate behavior.

	Scale*			
Belief	CAB	KAB	GBIBE	Total
Negativistic	.00	-.14	-.19	-.20
Naturalistic	.02	.11	.20	.19
Ecologistic	.18	.18	.13	.16
Moralistic	.05	.11	-.04	.02

*Correlations coefficients greater than .10 are significant at alpha = .01

CAB = Beliefs about consequence of appropriate behavior in reducing confrontations with bears.

KAB = Knowledge of appropriate behavior.

GBIBE = Knowledge of grizzly bear identification, biology and ecology.

Hypotheses Six and Seven concern the relationship between Negativistic beliefs and selection of settings, and perceptions of danger and feelings of safety. Hypothesis Six states that individuals holding Negativistic beliefs should select settings with low objective and subjective probabilities of encountering grizzly bears. To determine the objective probability of encountering grizzly bears, the authors discussed with officials of Glacier National Park the relative number of sightings reported in the Many Glacier and Sperry Chalet areas. Few sightings of grizzly bears have been reported in JBHA, although

the density of bears is relatively high (in fact, JBHA has an "image" of not having bears or bear problems). The setting with the highest objective probability of encountering a grizzly bear is the Many Glacier area, with Jewel Basin area the lowest. Table 11 reports the results of an Analysis of Variance (ANOVA) among the three areas for each of the belief scores. Visitors to JBHA reported the highest Negativistic belief scale score, but they were lower on the other three scales.

To assess the subjective probability of encountering bears, visitors were asked to indicate the likelihood of seeing a bear on their trip. Table 13 shows the variance in subjective probabilities among visitors to the three areas. Visitors to JBHA show a lower probability of seeing bears, while SC visitors show the highest probability at the highest end of the scale. Table 14 summarizes ANOVA data for the four external belief scales. As hypothesized, highest Negativistic scores are associated with the low subjective probabilities, although the ANOVA shows the differences are not statistically significant.

Hypothesis Seven suggests a relationship between Negativistic beliefs and perceptions of safety and danger while in the backcountry. JBHA visitors reported the safest feelings (Table 15) and they also were more likely to report that grizzly bears represented an insignificant danger to visitors (Table 16). SC visitors had the least feelings of safety and but did not differ from MG campers in terms of perceptions of grizzly bears.

Table 13. Subjective probability of encountering a grizzly bear by area, in percent.*

<u>Probability</u>	<u>JBHA</u>	<u>Area</u> <u>MG</u>	<u>SC</u>
Extremely Likely	0.6	3.0	3.6
Very Likely	1.8	6.0	9.1
Moderately Likely	6.7	27.6	19.8
Somewhat Likely	39.9	48.2	47.7
Not Likely	41.1	14.6	16.2
Don't Know	9.8	0.5	3.6

*Chi-square = 86.02, alpha = .01

Table 14. Mean external belief scores by subjective probability of encountering a grizzly bear.

<u>Belief</u>	<u>Subjective Probability</u>					
	<u>Extremely</u> <u>Likely</u>	<u>Very</u> <u>Likely</u>	<u>Moderately</u> <u>Likely</u>	<u>Somewhat</u> <u>Likely</u>	<u>Not</u> <u>Likely</u>	<u>Don't</u> <u>Know</u>
Negativistic	1.3	1.4	1.5	1.5	1.5	1.5
Naturalistic*	4.0	3.8	4.0	3.6	3.5	3.5
Moralistic	3.4	3.0	3.2	3.1	3.0	3.2
Ecologicistic*	4.2	3.9	4.2	4.0	3.9	3.9

*ANOVA indicates differences among means statistically significant at alpha = .05

Table 15. Feelings of safety while in the backcountry by area, in percent.*

<u>Level of Safety</u>	<u>JBHA</u>	Area <u>MG</u>	<u>SC</u>
Very Safe	30.9	19.5	13.5
Safe	60.6	69.7	72.5
Didn't think about it	1.8	2.6	1.6
Unsafe	6.1	8.2	9.3
Very Unsafe	0.6	0.0	3.1

*Chi-square = 25.22, alpha = .001

Table 16. Significance of danger grizzly bears represent to visitors by area, in percent.*

<u>Level of Danger</u>	<u>JBHA</u>	Area <u>MG</u>	<u>SC</u>
Very Insignificant	20.7	7.1	5.1
Insignificant	31.7	13.8	14.7
Some Significance	37.8	61.2	59.4
Extremely Significant	0.6	0.5	2.5
Don't Know	5.5	1.5	4.1

*Chi-square = 74.45, alpha = .00

representing a significant danger to backcountry campers. Table 17 shows a significant difference in Negativistic belief scores based on perceptions of danger, although the differences are relatively small. No differences in scores were found on the other belief scales. A slight tendency in the direction hypothesized is displayed in Table 18. (Sample sizes for the "Didn't think about it" and "Very Unsafe" categories are very small.) Table 18 also indicates that those who perceive the backcountry as "safe" hold higher Naturalistic beliefs.

Use of Appropriate Behavior to Reduce Confrontations With Bears

In this section, we directly describe how frequently visitors use the recommended appropriate behaviors to reduce confrontations with grizzly bears. These appropriate behaviors (AB) were developed from relevant agency literature. Thirteen ABs were incorporated in the study. Behaviors dealing with hiking after dark and cooking fish/bacon for meals were worded opposite the appropriate behavior as checks on response set. The frequency with which the set of appropriate behaviors were engaged in is shown in Table 19. JBHA visitors had the lowest AB score, while GNP visitors had the highest. SC visitors tended to participate somewhat less frequently in appropriate behaviors than MG visitors, although the differences were not statistically significant. Table 20 also shows the differences in participation for each of the 13 behaviors, in percent stating they "Always" or "Usually" practiced the recommended behaviors

Table 17. Mean belief scores by perceptions of grizzly bears as danger.

<u>Belief</u>	<u>Perception</u>					
	<u>Very Insigni- ficant</u>	<u>In- signi- ficant</u>	<u>Some signi- ficance</u>	<u>Signi- ficant</u>	<u>Extremely Signifi- cant</u>	<u>Don't know</u>
Negativistic*	1.5	1.4	1.5	1.7	1.4	2.7
Naturalistic	3.6	3.7	3.7	3.6	4.3	3.3
Moralistic	2.9	3.1	3.1	3.1	3.4	3.1
Ecologistic	4.1	4.0	4.0	4.0	4.2	3.9

*ANOVA indicates differences among means statistically significant at alpha = .05.

Table 18. Mean external belief sources by perceptions of backcountry safety.

<u>Belief</u>	<u>Perception of Safety</u>				
	<u>Very Safe</u>	<u>Safe</u>	<u>Didn't Think About it</u>	<u>Unsafe</u>	<u>Very Unsafe</u>
Negativistic*	1.3	1.5	1.7	1.7	1.3
Naturalistic*	3.9	3.6	3.7	3.4	3.9
Moralistic	3.0	3.1	3.4	3.0	3.1
Ecologistic	4.1	4.0	3.9	3.9	4.1

*ANOVA indicates differences among means statistically significant at alpha = .05.

Table 19. Mean Appropriate Behavior Scores by Area

<u>Area</u>	<u>N</u>	<u>Mean Score</u>	<u>Standard Deviation</u>
JBHA	155	29.2	4.6
MG	174	33.7	4.2
SC	181	33.5	4.6

ANOVA indicates differences among areas statistically significant at $\alpha = .02$.

Tukey's HSD Procedure shows significant differences between the JBHA and other respondents.

during their camping trip. Again, it is noteworthy that JBHA visitors tended to participate in several practices with less frequency than GNP visitors.

Engagement in these behaviors depends partly on what is under volitional control by the respondent. Many behaviors require specific equipment in order to carry out the behavior (such as hanging food in trees requires rope). About 22% of the sample carried two or fewer items of equipment necessary for appropriate behaviors, and we would expect that their participation in AB would be significantly influenced by the lack of equipment resources. Thus, Hypothesis Eight states "Use of AB is greatest for those visitors more appropriately equipped than those who are not." Respondents were asked to indicate if they carried with them certain types of equipment. The proportion

Table 20. Participation in recommended appropriate behaviors by area.

	<u>JBHA</u>	Area <u>MG</u>	<u>SC</u>
Percent Stating "Always or Usually"			
Store food in trees*	74.3	96.5	95.9
Make noise on trail	80.4	74.6	80.7
Camp or hike in large groups*	22.3	17.7	11.7
Wear or use bear bells*	16.6	41.2	43.9
Wash dishes after each meal	96.4	99.5	97.0
Cook 300 feet away from campsite*	27.0	89.9	86.0
Cook fish/bacon for meals *	63.6	96.9	92.2
Use odor restrictive containers	54.0	66.2	58.5
Wear clean clothes while sleeping	56.5	62.1	57.8
Cook downhill from sleeping area*	36.4	71.7	67.8
Camp away from animal or hiking trails*	69.1	88.1	88.9
Carry garbage out	99.4	99.0	98.4
Hike after dark *	98.0	99.5	98.4

* Items reversed to reduce response set

*Chi-square analyses indicate differences among areas statistically significant at alpha = .05.

carrying these items are shown in Table 21. Five items were judged necessary to engage in several of the appropriate behaviors: rope, air horn, bear spray, canned food, bear bells and odor proof containers. An equipment score was developed for each individual based on the number of equipment items carried. This score was then correlated (using a Spearman's rho nonparametric statistic) with the AB score. The correlation was .39 which is statistically significant at $\alpha = .001$, thus supporting the hypothesis.

Participation in behavior is viewed as a function of attitudes toward the behavior as well as subjective norms. Attitudes toward the behavior comprise two elements: beliefs about the behavior and beliefs about the consequences of the behavior. The set of behaviors we are concerned about here are those recommended to reduce confrontations with grizzly bears. Fishbein and Ajzen (1975) provide the overall framework for examining beliefs, subjective norms, and behavior. In this study, beliefs were measured on a 7 point scale assessing the respondent perception of the ease or difficulty in engaging in the behavior. While there are many consequences to this set of behaviors, we are particularly interested in the respondents perception of the ability of the behavior to reduce confrontations with bears, since that is the principal message agencies attempt to communicate to backcountry campers. Beliefs about consequences were thus measured on a 4 point scale assessing the respondents about the likelihood of any given

Table 21. Possession of equipment on camping trip by area, in percent.

<u>Item</u>	<u>Area</u>		
	<u>JBHA</u>	<u>MG</u>	<u>SC</u>
Fishing Rod*	70.3	29.6	35.2
Rope	75.8	81.9	78.4
Fresh Food*	66.7	54.8	52.3
Air Horn	0.6	0.5	2.5
Knife*	97.0	95.5	90.5
Saw or Hatchet*	38.8	13.1	12.1
Bear Spray	4.8	1.0	4.0
Fire Arm*	26.7	2.5	4.5
Canned Food	35.8	33.2	33.7
Bear Bells*	17.6	42.7	44.7
Freeze Dried/ Dehydrated Food*	73.3	84.9	79.4
Odor-proof Container	37.6	47.2	37.7

*Chi-square analysis indicates differences in possession among areas statistically significant at alpha = .05.

behavior reducing confrontations with bears. That data was summarized in Table 9.

Beliefs about each of the 11 appropriate behaviors were measured on a 7 point easy-difficult scale and are summarized in Table 22. The means show not only differences among the behaviors but among visitors to the three areas also. A summated scale score was developed by adding each of the individual

Table 22. Mean primary beliefs about behavior scores, by area

	Area				
	<u>JBHA</u>	<u>MG</u>	<u>SC</u>	<u>F</u>	<u>Alpha</u>
Store food in trees	5.1	5.5	5.4	2.4	.09
Make noise on trail	5.8	5.2	5.7	6.1	.00
Camp or hike in large group	2.9	2.6	2.5	2.2	.11
Cook 300 feet away from campsite	3.4	5.4	5.4	70.6	.00
Wear or use bear bells	3.8	4.5	5.0	9.8	.00
Wash dishes after each meal	6.4	6.3	6.2	.9	.41
Cook fish/bacon for meals	3.3	4.4	4.4	12.6	.00
Use odor restrictive containers	5.1	5.4	5.4	1.4	.25
Wear clean clothes while sleeping	4.8	4.2	4.5	3.5	.03
Cook downhill from sleeping area	4.1	5.1	5.0	14.2	.00
Camp away from animal or hiking trails	4.8	5.6	5.6	14.5	.00
Carry garbage out	6.7	6.5	6.6	3.2	.04
Hike after dark	5.0	4.6	5.0	1.9	.15
Overall Beliefs about Behavior	52.9	56.4	57.1	9.0	.00
Overall Beliefs about Consequences	35.7	36.6	36.4	1.5	.22

behavior belief items. Table 22 also shows these results and indicates that respondents in GNP see the appropriate behaviors as easier to do than the JBHA respondents. A similar summated scale for consequences was also developed and results are shown in Table 22 also. No significant differences among the respondents to the three areas were found. These findings lead us to the hypothesis that, other things being equal, participation in AB should be greater in GNP, a finding that is supported in Table 19.

The social normative component is comprised of two measures: the importance of different referents in forming expectations of appropriate behaviors and the motivation to comply with those expectations. Two scales were included on the questionnaire to measure these components.

Mean scores for each of the social normative items are shown in Tables 23 and 24. The importance of the nine referents varied considerably, although there were relatively few differences among visitors to the three areas. The most important referents in all three areas are the park and wilderness rangers who manage the area, suggesting the potential significance of this group in influencing behavior. However, other members of the camping group and other backcountry users that the respondent knows also are viewed as important, suggesting the potential importance of informal channels of communication.

Hypothesis Nine states that the multiple regression equation predicting participation in AB by attitudes toward behavior and

social normative factors will explain a statistically significant amount of variation in AB. Using the SPSSX statistical package, a multiple regression equation of the form

$$AB = (ab)_1 + (sn)_2 \quad \text{was developed and analyzed.}$$

Table 23. Mean Importance of Respondents' Referents, by area

Referent	Area				
	<u>JBHA</u>	<u>MU</u>	<u>SC</u>	<u>F</u>	<u>Alpha</u>
Other members of group	5.0	5.0	5.0	.09	.91
Backcountry users you know	4.7	4.3	4.2	3.0	.05
Backcountry users in area but not in group	--	3.7	3.7		
People you know who would like to use backcountry but haven't	2.7	3.1	3.3	2.9	.05
Park & Wilderness rangers who manage area	5.2	6.1	5.8	18.6	.00
Family members on trip	4.9	3.3	3.7	20.6	.00
Family members not on trip	3.1	2.5	2.6	4.5	.00
Society in general	3.1	3.2	2.9	1.3	.29
Backcountry magazines	3.2	2.9	2.9	1.2	.30

The attitudes toward behavior component consists of the summated cross product of the beliefs about the consequences of the behavior (measured as the subjective probability of a behavior to reduce confrontations) and evaluation of the behavior (as easy or

difficult to do). The social normative component likewise consists of a summated cross product of the respondent's normative beliefs (the importance of others) and the motivation to comply with other referents.

Table 24. Mean motivation to comply scores by referent and area.

<u>Referent</u>	<u>Area</u>				<u>Alpha</u>
	<u>JBHA</u>	<u>MG</u>	<u>SC</u>	<u>F</u>	
Other members of your group	6.0	6.2	5.9	2.6	.07
Backcountry users you know	6.0	5.8	5.8	1.4	.25
Backcountry users in area but not in group	3.8	3.2	3.6	3.1	.05
People you know who would like to use the backcountry but haven't	5.7	5.8	5.5	0.8	.46
Park & Wilderness ranger who manages the area	6.4	6.7	6.5	5.1	.01
Family members on trip	5.7	5.5	5.4	1.0	.38
Family members not on trip	4.1	3.6	3.7	2.0	.14
Society in general	3.4	3.4	3.2	1.2	.30
Backcountry magazines	4.6	4.9	4.9	1.1	.34

The multiple regression equation resulted in a multiple r of .49, which means that 24% of the variance in AB is explained by the multiple regression equation. As noted in the discussion about Hypothesis Eight, the availability of camping equipment is

associated with participation in AB. In order to control for this influence, an additional multiple regression was run including only those campers with more than two items of equipment. This step increased the multiple r to .54, resulting in 30% of the variance explained by the equation.

H10 stated that the standardized beta coefficients for both the attitude and social normative components would be statistically significant from zero. The multiple regression analysis resulted in the following equation:

$$AB = 22.1 + .49(ab) - .03(sn)$$

Only the standardized beta coefficient for ab was statistically significant at alpha = .05. A number of more complicated multiple regressions were attempted to more comprehensively discover any significant potential contribution of the social normative component. No analyses were found in which any social normative variable was found to be statistically associated with participation in AB.

Fishbein and Ajzen's (1975) articulation of their theory actually related attitudes toward the behavior and social normative components with behavioral intentions rather than actual reported behavior which we have been using in our analysis here. In order to determine if actual (reported) behavior is related to behavior intentions, a subsample (n=88) of visitors were asked to fill out a short questionnaire concerning behavioral intentions prior to going on their backpacking trip. These responses were then correlated with reported behaviors as

Table 25. Spearman's rho correlations between reported behavior and behavioral intentions.

<u>Behavior</u>	<u>rho</u>	<u>Alpha</u>
Store food in trees	.24	.02
Make noise on trails	.50	.00
Camp or hike in large group	.52	.00
Wear or use bear bells	.71	.00
Wash dishes after each meal	.24	.02
Cook 300 feet away from campsite	.44	.00
Cook fish/bacon for meals	.32	.00
Use odor restrictive containers	.58	.00
Wear clean clothes while sleeping	.61	.00
Cook downhill from sleeping area	.32	.00
Camp away from animal or hiking trails	.28	.00
Carry garbage out	-.02	.83
Hike after dark	.57	.00

indicated in the questionnaire. Table 25 shows the results of this analysis. Importantly, nearly all such correlations were statistically significant at the .05 level, the only exception being carrying garbage out. This may be a statistical artifact since nearly all visitors reported frequent compliance with this behavior. The summated AB score was correlated with the sum of

the behavioral intentions score resulting in a Spearman's rho of .50.

Table 26. Sources of information, perceived importance and reliability, in percent.

<u>Source</u>	<u>Importance</u>		<u>Most</u>	
	<u>Great</u>	<u>Little</u>	<u>Didn't Use</u>	<u>Reliable</u>
Ranger who issued permit	83	13	4	27
Printed information received with permit	81	16	3	16
Brochures handed out in park	76	21	3	7
Signs and bulletin boards in park	72	27	1	4
Previous experience	71	15	4	14
Rangers met in backcountry	66	15	19	14
Other members of group	50	34	16	2
Other users	46	42	12	4
Park newspaper	42	35	23	0
Visitor center exhibits	38	37	25	1
Magazine articles	34	36	30	0
Campfire programs	25	24	51	1
Films and TV programs	24	42	34	1
Newspaper articles	14	48	38	0

The final two hypotheses concerned the relationship between sources of information and participation in AB. Table 26 shows the use of a variety of information sources as reported by the visitors in our sample. Generally speaking, backcountry rangers and the printed information they handed out when giving permits to visitors were perceived as the most important sources of information. Backcountry rangers were also perceived to be the most reliable source of information by respondents. Other reliable sources of information included printed information given out with the backcountry permit, prior experience, and rangers encountered in the backcountry.

Hypothesis H12 states that those respondents citing use of agency information sources will report higher AB scores than those not using those sources. Table 26 shows that nearly the entire sample used agency sources of one kind or another. Thus, it is not possible to test this hypothesis.

The final hypothesis tested in this study dealt with source credibility. H13 states that those citing agency sources as most reliable will be more likely to engage in AB than those citing other sources. Table 27 shows the results of this test. Only about one-third of the sample responded to this question, probably because of the format of the item on the questionnaire. However, of those who did answer the question, 70% indicated that agency sources were the most reliable. The most frequently mentioned non-agency source was previous experience. Table 27 shows that those respondents citing agency sources reported

statistically significant higher AB scores than those citing other sources, thus supporting H13.

Table 27. Mean appropriate behavior (AB) score by reliability of agency versus non-agency information source.

<u>Source</u>	<u>N</u>	<u>Percent</u>	<u>Mean AB Score</u>
Agency	126	70	33.1
Non-agency	54	30	31.3
No answer	330	--	32.1

ANOVA test indicates differences among means statistically significant at alpha = .03

Tukey's HSD procedure indicates statistically significant mean scores between agency and non-agency sources.

DISCUSSION

Table 28 summarizes the results for the 12 hypotheses tested in this report. The results indicate broad, and relatively strong support for the conceptual and methodological approach used here. Although several hypotheses were only partially supported, only one of the 12 tested was rejected.

This study has demonstrated the utility of the Fishbein and Ajzen model attitude change as a way of understanding how persuasive message campaigns result in behavioral change. The model states, in generalized form, that beliefs and attitudes influence behavioral intentions and that given the condition of volitional control, people will perform the behavior they intend. Understanding what belief systems people hold, their beliefs about the consequences of a behavior, and their evaluation of that behavior can help managers design more effective persuasive message campaigns.

The data suggest that messages designed to increase visitor knowledge of appropriate behavior and sensitize them to ecologicistic versus negativistic ways of looking at bears are important communication steps. The statistically significant influence on AB participation associated with negativistic attitudes is suggestive of the need to re-evaluate message programs based on fear arousal. The results presented here indicate that sensitizing visitors to ecologicistic beliefs may be a more effective context for communicating AB than fear arousal. Further research on this issue is certainly needed prior to

implementation.

Table 28. Summary of Hypothesis testing.

<u>Hypothesis</u>	<u>Result</u>
H1	Supported, with the exception that no correlations with consequences of behavior (CAB) were found
H2	Supported
H3	Supported, with the exception of the CAB scale
H4	Supported
H5	Not supported
H6	Data trend in hypothesized direction, but not statistically significant
H7	Supported
H8	Supported
H9	Supported
H10	Beta coefficient for beliefs scale significant, but coefficient for social-normative not significant
H11	Supported
H12	Not tested
H13	Supported

The research also showed that understanding consequences of the behavior--in terms of reducing confrontations with bears--was not as strongly associated with AB as evaluating the behaviors as easy or difficult. This suggests that the content of messages on

AB could also emphasize the ease of AB as well. Again, the important role of ecologicistic beliefs was demonstrated in Table 12. The only external belief that was significantly correlated with beliefs about consequences was the ecologicistic dimension.

The results of testing H8 were most revealing. Engagement in AB was directly and significantly associated with being properly equipped. This finding has two implications for park management. First, it would be important to let people know prior to visiting the park of equipment needs so that they would have the time to secure the necessary items. While not all backcountry campers write the park prior to visiting it, many do, and this strategy would help increase participation in AB. Second, rangers issuing backcountry permits could check to determine what items the group has in its possession, thus increasing the ranger's knowledge about the probability of the group engaging in AB. From this knowledge, the ranger may suggest to the group that it acquire more equipment.

While the multiple r developed using the Fishbein and Ajzen model was significant and relatively large, the role of the social normative component in influencing participation in AB was not identified in this analysis. The data shows that agency sources of information are frequently used, important, and more likely to be viewed as a credible source than non-agency sources. However, several analyses designed to identify associations between social-normative scores and AB simply did not support any

of the hypotheses about this relationship. These findings have several implications. First, they obviously point to the critical role of visitor center rangers in communicating AB, beliefs, and knowledge. What is communicated and how it is communicated may have a significant effect on the visitors' engagement in AB. Thus, training in the substance as well as process of communication is important for permit issuing rangers.

Second, the data suggest that other members of the group are important in influencing behavior, particularly in Jewel Basin where permits are not required and little contact with rangers is made (Table 23). This indicates that in places where permits are not required that persuasive messages may need to incorporate a social-normative component. For example, a message might be designed that states "Other members of your group likely feel that AB will reduce confrontations with bears." Unfortunately, we were not able to satisfactorily document correlations between the social-normative component and AB. Braithwaite and McCool (in press) suggest a number of reasons for this finding, including the speculation that social-normative influences were not measured very well in this study.

However, their analysis did indicate that those respondents camping in some type of social group reported significantly higher social-normative scores than those camping alone, suggesting construct validity to the social-normative scales. The social-normative component could also explain non-participation in AB. Our measure attempted to define how strong the social-

normative forces are, not in what direction they lean. Indeed, as we pointed out in the introduction to this report, social-normative influences could act to counterbalance agency recommended behaviors. Braithwaite and McCool did report a statistically significant association between the social-normative component and visitor's desired distance to a bear, suggesting that the scale measured influences in a positive way. Why there was no association with camping behaviors, we simply do not know. With our current measures, we are not able to determine accurately the direction of the social-normative influences.

FUTURE RESEARCH

The research described here is a rich area for future endeavors. The basic Fishbein and Ajzen model was supported. Yet, a number of questions remain unanswered or are triggered by our findings.

The problem with the social-normative component appears to be a major issue with the model. Fishbein and Ajzen themselves admit that this component has had the least theoretical attention during model development. It could be that the two subcomponents--importance of referents and motivation to comply--are simply incorrect or inappropriate concepts. It seems logical that social-normative influences would be exceedingly important in small group situations where threats of hazards permeate the experience.

An alternative interpretation concerns our specific

measures. Developing scales to measure these concepts that respondents will complete is difficult. We noted that many respondents felt that the two scales were redundant, and failed to complete both. (Of course, these individuals were not included in our analysis.) The fact that many did so suggests that multi-item scales measuring the two sub-components may be inappropriate in large scale survey research situations. Obviously, a fruitful area of research is developing scales measuring these concepts.

A good place to start is with a qualitative approach using in-depth interviews to identify the social-normative forces. These interviews could begin by probing rationales for visiting the area, perceptions of agencies and their employees, and determining group processes and structures. The interviews might be structured around the two sub-components of the social-normative area. These interviews could then be followed up by more quantitatively oriented survey research or even some type of laboratory experimentation.

Another area that should be pursued is the efficacy of using ecologicistic versus negativistic beliefs as a facilitating medium to communicate AB. The research suggests that ecologicistic beliefs are more likely to be associated with AB than are negativistic beliefs. This tentative hypothesis could be tested in a laboratory setting complete with different types of messages within the context of different beliefs and directed at individuals holding stronger or weaker negativistic and

ecologicistic beliefs. A suitable place to conduct this research is a university setting with subject pools available. In addition, research conducted in this setting could ensure testing of creative message treatments without the potential negative consequence of subjects being injured by a bear as a result of a message treatment.

While the above suggested experiment would enable testing of different messages and their effects on behavioral intentions, it would not allow observation of actual behavior--also a weakness of the current study. A final area of research then is to conduct some field experiments in situations where actual observation could be observed. In the field experiment, subjects could be given different messages and their resulting behavior observed. This would be a logical outgrowth of the laboratory experiments.

For example, the current study suggests the efficacy of messages with an ecologicistic theme. The laboratory experiments may confirm this. Further testing in the field could indicate the practical use of such a theme. One place to conduct this research is in Jewel Basin. Campers in Jewel Basin, as our research shows, have the least knowledge about AB and do not engage in it as frequently as campers in Glacier. In addition, Jewel Basin campers do not receive any agency information about AB at the trailhead. Finally, Jewel Basin is small enough that observations of behavior could be made relatively easily, simply by hiking around to the different lakes in the evening and

observing behavior of different treatment groups.

The combination of the these research projects would greatly add to our knowledge of how to communicate more effectively with backcountry users, and would have implications far beyond the problem of human-bear confrontations. Many other areas of management could benefit, including minimum impact messages, other safety and health hazards and site choice behavior.

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APPENDIX A

Observation Instrument

Have any additional comments or suggestions on how to improve the
management of this backcountry area? Any general comments?

BACKCOUNTRY VISITOR SURVEY

PLEASE PLACE YOUR COMPLETED QUESTIONNAIRE IN THE STAMPED, SELF-ADDRESSED ENVELOPE
PROVIDED AND DROP IN ANY CONVENIENT MAILBOX

THANK YOU FOR YOUR HELP
School of Forestry
University of Montana



School of Forestry
University of Montana

UNIVERSITY OF MONTANA

School of Forestry
Missoula, Montana 59812

Backcountry Visitor Survey

Use answer all questions as they relate to your most recent backpacking trip
Glacier National Park.

Was this your first visit to the Glacier National Park backcountry?
(Circle one number)

- 1 YES (Please go to Question 2)
2 NO (Please answer the following)

Including your recent visit, about how many times have you
backpacked in this backcountry area?

- 1 ONE TO THREE TIMES 3 EIGHT TO TWELVE TIMES
2 FOUR TO SEVEN TIMES 4 OVER TWELVE TIMES

Prior to this visit, about how many backpacking trips have you taken in
Yellowstone National Park, or in wilderness areas in Montana?
(Circle one number)

- 1 NONE 3 FOUR TO SEVEN
2 ONE TO THREE 4 EIGHT OR MORE

On this backpacking trip, what type of group were you with?
(Circle one number)

- 1 ALONE 4 FAMILY & FRIENDS
2 FAMILY 5 GUIDE OR OUTFITTER
3 FRIENDS 6 CLUB OR ORGANIZED GROUP

About how many people were in your group including yourself?
(Circle one number)

- 1 ONE OR TWO 4 SEVEN TO TEN
2 THREE TO FOUR 5 ELEVEN OR MORE
3 FIVE TO SIX

How many nights did you camp overnight in the backcountry on this visit?

NUMBER OF NIGHTS _____

During this visit, did you observe any wildlife?

- 1 NO
2 YES, Please list _____

GENERALLY
WANT TO

GENERALLY
WANT NOT TO

DON'T
KNOW

People you know who
would like to use the
backcountry but haven't

--	--	--	--	--	--	--	--	--	--

Park and wilderness
rangers who manage
the area

--	--	--	--	--	--	--	--	--	--

Family members on trip

--	--	--	--	--	--	--	--	--	--

Family members not
on trip

--	--	--	--	--	--	--	--	--	--

Society in general

--	--	--	--	--	--	--	--	--	--

Backcountry magazines

--	--	--	--	--	--	--	--	--	--

Background Information

Finally, we have a few questions about you personally that provide information useful
in management. Remember, you will not be identified with your answers, so please be
frank.

Q-22. What is your present age? _____

Q-23. Are you?

- 1 FEMALE
2 MALE

Q-24. What best describes the area in which you live?

- 1 LARGE CITY OVER ONE MILLION PEOPLE
2 MEDIUM CITY 50,000 TO ONE MILLION PEOPLE
3 SMALL CITY 5,000 TO 50,000 PEOPLE
4 TOWN 1,000 TO 5,000 PEOPLE
5 RURAL
6 FARM

Q-25. What is the highest level of education you have completed so far?
(Circle one number)

- | | | | | | | | | | | | | | | | |
|------------|---|---|---|---|---|---|---|-------------|----|----|----|---------|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| ELEMENTARY | | | | | | | | HIGH SCHOOL | | | | COLLEGE | | | |

Q-26. What is your occupation? (Please indicate what kind of work you do, not for
whom you work. If you are a homemaker, student, or retired, please so
indicate.)

Country management agencies have suggested a number of camping and backpacking techniques that backpackers can use to reduce confrontations with grizzly bears. Indicate how likely you feel each of the listed techniques will reduce confrontations with bears.

Likelihood of reducing confrontations?
(Circle one answer)

	VERY LIKELY	LIKELY	UNLIKELY	VERY UNLIKELY
Store food in trees	VL	L	U	VU
Make noise on trail	VL	L	U	VU
Camp or hike in large group (over 5 people) . . .	VL	L	U	VU
Cook 300 feet away from campsite	VL	L	U	VU
Wear or use bear bells . . .	VL	L	U	VU
Wash dishes after each meal	VL	L	U	VU
Cook fish/bacon for meals	VL	L	U	VU
Use odor restrictive containers	VL	L	U	VU
Wear clean clothes while sleeping	VL	L	U	VU
Cook downhill from sleeping area	VL	L	U	VU
Camp away from animal or hiking trails	VL	L	U	VU
Carry out garbage	VL	L	U	VU
Hike after dark	VL	L	U	VU

Q-21. Generally speaking, when on a backpacking trip, to what extent do you want to comply with the techniques the following people or groups of people recommend?

Want to or want not to comply?
(Circle the place on the line that best represents your opinion)

	GENERALLY WANT TO	GENERALLY WANT NOT TO	DON'T KNOW
Other members of your group	_____	_____	_____
Backcountry users that you know	_____	_____	_____
Backcountry users in the area but not known to you	_____	_____	_____

Q-7. What type of equipment did you take on this trip?
(Circle all numbers that apply)

1 FISHING ROD	7 BEAR SPRAY
2 ROPE	8 FIRE ARM
3 FRESH FOOD	9 CANNED FOOD
4 AIR HORN	10 BEAR BELLS
5 KNIFE	11 FREEZE DRIED/DEHYDRATED FOOD
6 SAW OR HATCHET	12 ODOR PROOF CONTAINER

Q-8. Did the presence of grizzly bears in the backcountry have any effect on your decision on where to go backpacking?

1 NO
2 YES, Please describe how _____

Q-9. How did you feel about the likelihood of seeing a grizzly bear on this trip? (Circle one number)

1 EXTREMELY LIKELY	5 SOMEWHAT LIKELY
2 VERY LIKELY	6 NOT AT ALL LIKELY
3 MODERATELY LIKELY	7 DON'T KNOW

Q-10. When you were planning your backpacking trip into this area, how close did you want to get to a grizzly bear? (Circle one number)

1 NEVER WANTED TO SEE ONE
2 WANTED TO VIEW ONE FROM A GREAT DISTANCE
3 WANTED TO GET CLOSE ENOUGH FOR A GOOD LOOK OR PHOTOGRAPH
4 DIDN'T THINK ABOUT IT

Q-11. To what extent do you feel grizzly bears represent a danger to backcountry campers in this area? (Circle one number)

1 VERY INSIGNIFICANT DANGER	4 SIGNIFICANT DANGER
2 INSIGNIFICANT DANGER	5 EXTREMELY SIGNIFICANT DANGER
3 SOME DANGER	6 DON'T KNOW

Q-12. How safe did you feel while on this trip? (Circle one number)

1 VERY UNSAFE	4 SAFE
2 UNSAFE	5 VERY SAFE
3 DID NOT THINK ABOUT BEAR DANGERS	

Q-13. Do you feel that you would know what to do if you encountered a grizzly bear in the backcountry?

1 YES
2 UNCERTAIN
3 NO

Q-14. How often did you practice each of the following backcountry camping techniques? Please indicate how frequently you practiced each during your backpacking trip. Please be frank.

	How frequently did you? (Circle one answer)			
Store food in trees	ALWAYS	USUALLY	SELDON	NEVER
Make noise on trail	ALWAYS	USUALLY	SELDON	NEVER
Camp or hike in large groups (over 5)	ALWAYS	USUALLY	SELDON	NEVER
Wear or use bear bells	ALWAYS	USUALLY	SELDON	NEVER
Wash dishes after each meal	ALWAYS	USUALLY	SELDON	NEVER
Cook 300 feet away from campsite	ALWAYS	USUALLY	SELDON	NEVER
Cook fish/bacon for meals	ALWAYS	USUALLY	SELDON	NEVER
Use odor restrictive containers	ALWAYS	USUALLY	SELDON	NEVER
Wear clean clothes while sleeping	ALWAYS	USUALLY	SELDON	NEVER
Cook downhill from sleeping area	ALWAYS	USUALLY	SELDON	NEVER
Camp away from animal or hiking trails	ALWAYS	USUALLY	SELDON	NEVER
Carry garbage out	ALWAYS	USUALLY	SELDON	NEVER
Hike after dark	ALWAYS	USUALLY	SELDON	NEVER

Q-15. How important are the following people or groups of people in determining what camping techniques you practice while on a backpacking trip?

	Check the appropriate box						
	Not at all Important	Slightly Important	Somewhat Important	Moderately Important	Very Important	Extremely Important	Did Not Use
Other members of your group	()	()	()	()	()	()	()
Backcountry users that you know	()	()	()	()	()	()	()
Backcountry users in the area but not in your group	()	()	()	()	()	()	()
People you know who would like to use the backcountry but haven't	()	()	()	()	()	()	()
Park and wilderness rangers who manage the area	()	()	()	()	()	()	()

	Basically True	Basically False	Not Sure
The black bear has a prominent hump over the front shoulders.	T	F	NS
The color of grizzly bears may range from light brown to dark black.	T	F	NS
All sightings of bears should be reported to a ranger.	T	F	NS
Bears are usually shy.	T	F	NS
Bears usually do not have an excellent sense of smell.	T	F	NS
Black bears are never found in a color other than black.	T	F	NS
Bears can attack without warning.	T	F	NS
Dogs can lead a bear back to you.	T	F	NS
Bears go into a deep sleep during the winter months.	T	F	NS
Bears are primarily carnivores.	T	F	NS
It is usually not a good idea to get between a sow and cubs.	T	F	NS
Bears do not like fish.	T	F	NS
Grizzly bears have relatively poor eyesight.	T	F	NS
Bears that obtain human foods may lose their fear of people.	T	F	NS
Fewer than 1000 grizzly bears survive in the lower 48 states.	T	F	NS
All bears are potentially dangerous.	T	F	NS
Hiking after dark is acceptable in bear country.	T	F	NS
Dogs are useful in keeping bears away.	T	F	NS
It is usually impossible to outrun a bear.	T	F	NS
Female grizzly bears usually breed before they are 5 years old.	T	F	NS

18. When backpacking how difficult or easy do you find practicing each of the following?

	About how difficult or easy? (Circle the place that best represents your opinion)					
	EASY			DIFFICULT		
Store food in trees						
Make noise on trail . . .						
Camp or hike in large group (over 5 people)						
Look 300 feet away from campsite						
Hear or use bear bells						
Wash dishes after each meal						
Look fish/bacon for meals						
Use odor restrictive containers						
Hear clean clothes while sleeping						
Look downhill from sleeping area						
Camp away from animal or hiking trails						
Carry garbage out						
Hike after dark						

19. We are interested in your knowledge of bears. Please indicate whether you feel each of the following statements is basically true, basically false, or if you are unsure. Circle one answer.

	Basically True	Basically False	Not Sure
The grizzly bear is a threatened species in the lower 48 states.	T	F	NS
Black bears usually have a "dish" shaped face.	T	F	NS
The muzzle of a grizzly bear is straight and long.	T	F	NS
Bears are usually unpredictable in their behavior.	T	F	NS
The front claws of grizzly bears are	T	F	NS

Not at all
Important
Slightly
Important
Somewhat
Important
Moderately
Important
Very
Important
Extremely
Important
Did Not Use

Family members on trip	()	()	()	()	()	()	()
Family members not on trip	()	()	()	()	()	()	()
Society in general	()	()	()	()	()	()	()
Backcountry magazines . .	()	()	()	()	()	()	()

Q-16. The following statements ask for your opinions about grizzly bears. Please circle the response which most closely corresponds to your opinion

	To what extent do you agree? (Circle one answer)				
	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONG DISAGR
I think grizzly bears are essential to the balance of nature.	SA	A	N	D	SD
There is nothing wrong with grizzly bears eating garbage.	SA	A	N	D	SD
Seeing a grizzly bear in the wild would be one of the greatest outdoor experiences of my life.	SA	A	N	D	SD
Grizzly bears should be eliminated in areas outside of national parks.	SA	A	N	D	SD
I think its wrong to kill grizzly bears.	SA	A	N	D	SD
To me, the grizzly bear symbolizes the beauty and wonder of nature.	SA	A	N	D	SD
I think grizzly bears are among the few animals who will kill for the pleasure of killing.	SA	A	N	D	SD
I think the hunting season on grizzly bears encourages more illegal killing of them.	SA	A	N	D	SD
Montana would be a nicer place to live if fewer dangerous animals, like grizzly bears were found here.	SA	A	N	D	SD
If oil or natural gas were discovered in grizzly habitat, the resource should be extracted even if it harmed bears. . . .	SA	A	N	D	SD

AGREE AGREE NEUTRAL DISAGREE DISAGREE

I believe so many grizzly bears are being illegally killed in Montana that if something is not done to stop it, the bear will soon disappear from the state.

I think when grizzly bears kill cattle and sheep they must be eliminated. . . .

Because people and cattle live practically everywhere in the United States, and grizzly bears only in Montana and Alaska, I think Montana should make sacrifices when there is a conflict with the bear. . . .

Agencies should provide more natural conditions for grizzly bears, even if this means more visitor restrictions.

I would very much like to see
a grizzly bear in the wild.

Some animals like grizzly bears, wolves, and rattlesnakes are naturally cruel. . . .

In my opinion, the grizzly bear is essential for keeping other plant and animal species in proper balance with nature.

The current hunting season on grizzly bears confuses the public about the need to protect them. . . .

I would be afraid if a grizzly bear lived near my house.

The relocation of problem grizzlies causes an interruption of the normal cycle of nature. . . .

If farmers were more careful about how they take care of their cattle, there would be fewer livestock killed by grizzlies.

I think it would be wonderful to see grizzly bear sign in the wild.

Q-17. Listed below are several sources of information people use in order to learn how to camp in grizzly bear country. Please indicate how important each source was for you on this trip. Then use a check (☐) beside the source you feel is most reliable.

Check the appropriate box

	Not at all Important	Slightly Important	Somewhat Important	Moderately Important	Very Important	Extremely Important	Did Not Use
Signs and bulletin boards in park	()	()	()	()	()	()	()
Rangers you met in the backcountry	()	()	()	()	()	()	()
Brochures handed out at at park entrance	()	()	()	()	()	()	()
Magazine articles	()	()	()	()	()	()	()
Park newspaper	()	()	()	()	()	()	()
Printed information received with camping permit	()	()	()	()	()	()	()
Other backcountry users	()	()	()	()	()	()	()
Ranger who issued you backcountry permit	()	()	()	()	()	()	()
Films and TV programs	()	()	()	()	()	()	()
Newspaper articles	()	()	()	()	()	()	()
Other members of your group	()	()	()	()	()	()	()
"Campfire" talks by park rangers	()	()	()	()	()	()	()
Your previous camping experience	()	()	()	()	()	()	()
Exhibits at visitor centers	()	()	()	()	()	()	()
Other _____	()	()	()	()	()	()	()